

PATENT SPECIFICATION

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(54) IMPROVEMENTS RELATING TO SCREENS SUITABLE FOR USE IN PHOTO-ENGRAVING AND PHOTO-LITHOGRAPHIC PROCESSES AND IN COLOUR TELEVISION

(71) I, RAYMOND BUCKLEY, a British Subject of 13 Church Street, Wood Lane, Bignall End, Stoke-on-Trent, Staffordshire, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:

This invention relates to light-transmitting screens for use with members having a medium for receiving light and forming a pattern corresponding to any image being transmitted by the light. The invention is particularly useful in the printing of half-tone illustrations such as photographs in photo-engraving and photo-lithographic processes, and in colour television.

According to one aspect of the present invention there is provided, in use with a member having a medium for receiving lights and forming a pattern corresponding to any image being transmitted, a light transmitting screen comprising a sheet of transparent material, one surface of which is non-planar and is formed with a plurality of pointed formations, said screen being disposed with said one surface remote from said medium such that light from an exposure arrangement is incident on said one surface and is refracted as it passes through the screen to the medium, any image being transmitted being broken up into a pattern of dots, as hereinafter defined, by said pointed formations, said formations adjoining one another such that said one surface is free of interstices.

According to another aspect of the invention there is provided a method of transmitting an image on to a member having a medium for receiving light and forming a pattern corresponding to any image being transmitted, said method comprising the steps of disposing a light transmitting screen with one surface remote from the medium

such that light from an exposure arrangement is incident on said one surface and is refracted as it passes through the screen to the medium, the screen having a plurality of pointed formations on said one surface, said formations adjoining one another such that said one surface is free of interstices, and breaking up any image being transmitted on to the member into a pattern of dots, as hereinafter defined, by said pointed formations.

Preferably said formations are defined by projections extending from said one surface.

Alternatively said formations are defined by depressions in said one surface.

The formations may be formed as triangular or square pyramids, the bases of which adjoin one another. Alternatively the formations may be of conical configuration, the bases partially intersecting one another.

An embodiment of the present invention will now be described by way of example with reference to the accompanying drawing which is a plan view of a screen used in the invention.

Referring to the drawing, a light-transmitting screen 10, formed from a sheet of transparent material, has a series of triangular pyramids 12 projecting from one surface to define a surface having points 18. The reverse face (not shown) has a planar surface. The bases 14 of the pyramids adjoin one another such that the pyramids cover the whole area of the screen without interstices. The triangular surfaces 16 of each pyramid are equal and equilateral.

In further embodiments (not shown) the screen has a series of square pyramids, the bases of which adjoin one another, or has conical projections, the bases of which partially intersect one another.

It is envisaged that the pyramidal or conical formations may be in the form of depressions in said one surface. Also the area of each triangular surface of each pyramid may

be planar or may have a parabolic or part spherical arcuate form.

In printing it is necessary to convert continuous tone illustrations, such as photographs, into a printable form by breaking up the image into a pattern of small dots of varying intensity according to the light and dark areas of the image. The dots, which are to be considered as small areas not necessarily round in shape, are conventionally produced on a photographic member or plate by making a photographic exposure through a light-transmitting screen, normally glass, which is divided into small squares by an intersecting pattern of fine lines, and a negative is thus obtained.

To improve the quality of the final print, it is often necessary to touch up at some stage in the process by filling in the areas between dots where dark areas are located and by removing highlight dots where light areas are located.

When used in printing, the screen disclosed herein replaces the conventional screen and is disposed such that light from an exposure arrangement is incident on the surface of the screen having the pointed formations and is refracted as it passes through the screen, any image being transmitted being broken up into a pattern of dots on the light receiving medium of the photographic member.

It will be appreciated that each pyramidal formation on the screen can be used to form a single dot, e.g. with equilateral triangular surfaces, or three separate dots, e.g. with the triangular surfaces preferably at an angle of 26° to the base. When the screen is used in printing it is considered that 80 pyramids to the inch may be a suitable dimension, but it is to be understood that this figure is given only by way of example. By reducing the amount of time occupied in retouching, the invention will effect much saving of time, expense and tedious work. The screen will also have a beneficial effect in the reproduction of light gradations and reduce the need for lens filters.

In one known form of colour television a shadow-mask tube may be used wherein a fluorescent screen composed of three separate sets of phosphor dots, which glow in a different colour, has a mask provided with holes aligned with the dots. Three electron guns produce separate beams which produce red, green and blue images, and the electrons discharged by each gun impinge only on the appropriate dots by virtue of the mask.

When used in colour television, a screen as disclosed herein, preferably with pyramidal formations, replaces the conventional mask and is disposed such that light from a single electron gun is incident on the surface of the screen having the pointed formations

and is refracted as it passes through the screen. When an image in colour is transmitted, through filters, the primary colours are transmitted in different wavelengths and are incident on different areas of the surface of the formations, the image being broken up into a pattern of dots of the different colours on the light receiving medium, i.e. the phosphor screen. The surfaces of each pyramid may be subtended at different angles to change the patterns of the dots.

The picture produced is more stable, the cost of manufacturing an appropriate tube would be reduced, and the receiver could be more compactly designed.

Various modifications may be made without departing from the scope of the invention. For example, the screen may be formed of two sheets of material the other sheet having both surfaces planar and being attached to the non-planar surface of the first sheet to protect the latter and keep it clean.

WHAT I CLAIM IS:—

1. In use with a member having a medium for receiving light and forming a pattern corresponding to any image being transmitted, a light transmitting screen comprising a sheet of transparent material, one surface of which is non-planar and is formed with a plurality of pointed formations, said screen being disposed with said one surface remote from said medium such that light from an exposure arrangement is incident on said one surface and is refracted as it passes through the screen to the medium, any image being transmitted being broken up into a pattern of dots, as hereinbefore defined, by said pointed formations, said formations adjoining one another such that said one surface is free of interstices.

2. A screen in use as claimed in Claim 1, wherein said formations are defined by projections extending from said one surface.

3. A screen in use as claimed in Claim 1, wherein said formations are defined by depressions in said one surface.

4. A screen in use as claimed in any of Claims 1 to 3, wherein said formations are formed as triangular pyramids, the bases of which adjoin one another.

5. A screen in use as claimed in any of Claims 1 to 3, wherein said formations are formed as square pyramids, the bases of which adjoin one another.

6. A screen in use as claimed in Claim 4 or 5, wherein the triangular surfaces of each pyramid are equal and equilateral.

7. A screen in use as claimed in Claim 4, wherein the triangular surfaces extending from the base of each pyramid are subtended at different angles.

8. A screen in use as claimed in any of Claims 1 to 3, wherein said formations are

of conical configuration, the bases partially intersecting one another.

9. A screen in use as claimed in any of the preceding claims, wherein the screen is formed from a single sheet the reverse face of which has a planar surface.

10. A screen in use formed from two sheets of transparent material, one sheet being the screen of any of Claims 1 to 8 and having a planar reverse face, and the other sheet having both faces planar, said other sheet being attached to said non-planar surface of said one sheet.

11. A method of transmitting an image on to a member having a medium for receiving light and forming a pattern corresponding to any image being transmitted said method comprising the steps of disposing a light transmitting screen with one surface remote from the medium such that light from an exposure arrangement is incident on said one surface and is refracted as it passes through the screen to the medium,

the screen having a plurality of pointed formations on said one surface, said formations adjoining one another such that said one surface is free of interstices, and breaking up any image being transmitted on to the member into a pattern of dots, as hereinbefore defined, by said pointed formations.

12. In use with a member having a medium for receiving light and forming a pattern corresponding to any image being transmitted, a light transmitting screen substantially as hereinbefore described with reference to the accompanying drawing.

13. A method of transmitting an image on to a member having a medium for receiving light and forming a pattern corresponding to any image being transmitted substantially as hereinbefore described.

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1 SHEET

COMPLETE SPECIFICATION

*This drawing is a reproduction of
the Original on a reduced scale.*

